CHAPTER 6
DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the results of feasibility level investigations made to identify solutions to the water and related land resource problems and needs within the Johnson Creek, Arlington, Texas study area.

DISCUSSIONS

The project study area encompasses the Johnson Creek watershed within the city of Arlington, Texas.

In November 1995, the Arlington city council, because of a desire for a more environmentally sensitive solution to flooding problems, rejected a Corps of Engineers proposal for implementation of a Section 205 structural channelization project. Following this decision, the city pursued further investigations by the Corps and by a consortium of consulting engineers to develop flood damage reduction measures, in conjunction with ecosystem restoration and recreation features, which could enhance and emphasize Johnson Creek's value as an asset to the city.

The primary planning objective for this feasibility level investigation, therefore, was to determine the most economically and environmentally feasible plan to substantially alleviate the flooding problems along the creek, which would also be supportable by the local residents and sponsor. Cooperation between the city, the consortium of consulting engineers, and the Corps led to the adoption of a mutual existing conditions hydraulic model, used to develop and analyze the various structural and non-structural alternatives investigated.

The National Economic Development (NED) Plan identified in this investigation would consist of the acquisition and removal of a total of 109 structures in the 20 percent annual chance of exceedance (ACE) (5-year flood) zone, within reaches 5 and 6 of the watershed. The total cost of this acquisition and removal would be approximately $11,946,400, and would include $1,137,600 in relocation assistance costs. Recreation features would be added to the lands acquired for this evacuation plan. These features would include 6,634 linear feet of concrete trail, configured to allow access from four different areas. Two of the access areas would be constructed on lands currently occupied by structures, and would each include 12 parking spaces. The other two access areas would utilize portions of Ruby Street and Turtle Creek Drive identified for closure, but would increase the asphalt-paved area to accommodate a total of 12 parking spaces each. Informational kiosks, security lighting and a drinking fountain would be provided at each of these access points. Three footbridges, each measuring 10-feet wide and 120-feet long, would span the creek within reach 5, and would support pedestrian, bicycle, and maintenance vehicle traffic. A total of 35 uncovered picnic sites would be located within reach 5, and a 30-foot by 60-foot pavilion would be located in the evacuation area north of Mitchell Street, and adjacent to Collins Street. The total first cost of these recreational features, including engineering, design and construction management would be approximately $832,700. Annual net recreation benefits of $595,900 would be added to the net flood damage reduction benefits derived from the acquisition and removal plan, thereby creating a cumulative flood damage reduction annual net benefit of $449,600.

Ecosystem restoration measures, developed to best meet the environmental needs identified within the creek corridor, were also identified as part of the NED Plan. These measures would include acquisition of approximately 195 acres of currently undeveloped areas within the corridor, of which 94 acres would be existing grass / shrub lands and 101 acres would be existing forested areas. The measures identified as most effective for conversion of grass / shrub land would involve the planting of 5 one-inch caliper containerized trees, 5 one-gallon shrubs and 200 seedlings per acre. Improvement of existing forested areas would be accomplished by planting 5 one-inch caliper containerized trees and 5 one-gallon shrubs per acre. Additional forest management techniques

would be required, such as girdling trees or limbs to create snags and cavities and selective thinning of the canopy or understory vegetation, in forested tracts where application of these techniques is needed to improve the quality of the habitat for wildlife. The first cost of the environmental measures would total approximately $2,564,000. These measures would yield gains of 149.66 average annual habitat units (AAHU) over the No Action alternative.

Recreation features were also added to the ecosystem restoration lands. Due to the limits placed on the costs of recreational facilities on restoration lands, the only such recreation features in the Recommended Plan would include 1,406 linear feet of concrete trail, and would link the main acquisition area in reach 5 to the evacuation area containing the proposed pavilion, described above. The total first cost of these recreational features would be approximately $63,500, with annual charges of $9,800. Annual recreation benefits of $58,100 would be obtained, yielding annual net benefits of $48,300, and a BCR of 5.95.

The total financial cost of this NED Plan would be approximately $15,406,500. The total economic cost used to evaluate benefit-cost ratios would be approximately $11,705,000. Ecosystem restoration costs are not included in economic costs due to the non-monetary outputs yielded by restoration measures. Real estate relocation assistance costs are also excluded from economic costs. Annual economic costs of the NED Plan would be approximately $983,400, and total economic benefits would equal approximately $1,480,800. Annual net benefits would be about $497,400, with a BCR of 1.51.

In accordance with policy guidelines which state that, in the absence of an exception approved by the Assistant Secretary of the Army - Civil Works (ASA(CW)), the NED Plan must be the plan recommended for implementation, this plan was identified as the Recommended Plan.

The sponsor's long-range master plan for the creek corridor includes the eventual removal and/or protection of all persons and property from the 1 percent ACE flood event (100-year flood). As a step toward that goal, the Locally Preferred Plan (LPP) was selected. This plan would include the acquisition and removal of 138 residential structures in the 4 percent ACE (25-year flood) zone within reach 5, in addition to the two structures in reach 6 included in the NED Plan. Additional recreation features within this evacuation zone would include 1,043 linear feet of trail and one additional access area. The total economic costs for these acquisition / recreation measures would be approximately $14,493,400.

Due to the sponsor's desire to eventually add detention ponds in two of the areas proposed for ecosystem restoration in the NED Plan, these two areas would be removed from project consideration in the LPP. Therefore, a total of approximately 155 acres would be acquired for ecosystem restoration in the LPP. An incremental analysis was performed, as in the NED Plan, to determine the most effective measures to implement. The outputs of the proposed plan would be a gain of 117.27 AAHU over the No Action alternative, with a total ecosystem restoration cost of approximately $1,939,700.

The sponsor's master plan also envisions a continuous recreation trail throughout the creek corridor. The LPP, therefore, would include a substantially greater amount of recreation facilities on the lands acquired for ecosystem restoration. These facilities would include 24,175 linear feet of trail, two access points, one low-water crossing, and eight footbridges. The total cost for these facilities, and associated security lighting and water fountains at the access points, would total approximately $1,948,900.

The total financial cost of the LPP was calculated to be approximately $19,859,600. Total economic costs of $16,462,800, annual costs of $1,412,600, annual benefits of $2,540,900, net annual benefits of $1,128,300, and a BCR of 1.80 were estimated for this plan.

Due to the sponsor's desire to implement a plan which varies from the Recommended Plan, a request for exception will be considered to allow full Federal participation in the LPP. This

exception was presented in two phases in this report. The first phase, which would result in a plan designated as the LPP (Limited) would encompass the increased acquisition and removal plans and the decreased ecosystem restoration measures identified in the LPP. The recreation facilities included in this first phase would allow for a complete recreation experience for the user, centered around the main facilities in the acquisition area, but also allowing passage through restoration areas upstream and downstream of this area. The main differences between the LPP (Limited) and the LPP would be the amount of recreation trail and number of footbridges in the ecosystem restoration areas. The LPP (Limited) would include 4,660 linear feet of trail and one footbridge in these areas, while the LPP would include 24,175 linear feet of trail and eight footbridges. The total economic cost of the LPP (Limited) would be approximately $14,874,900. Annual costs of $1,259,200, and annual benefits of $1,710,000 would yield annual net benefits of $450,800 and a BCR of 1.36.

CONCLUSIONS

The following conclusions are based on the study findings conducted in connection with this feasibility level report:

a. A significant need for a local flood damage reduction project within the Johnson Creek, Arlington study area exists. There also exists a potential for implementation of ecosystem restoration measures and construction of recreation facilities to meet the identified needs of these project purposes.

b. The Recommended Plan is a multi-objective project which would consist of non-structural flood damage reduction measures, ecosystem restoration features, and recreation amenities.

c. The Locally Preferred Plan would entail increased flood damage reduction and recreation features, and decreased ecosystem restoration measures.

d. A two-phased request for exception was proposed for consideration.

e. The city of Arlington was identified as the local sponsor for construction of the project. Federal and non-Federal cost apportionments for the Recommended Plan were estimated at $9,879,800 (64.1%) Federal and $5,526,700 (35.9%) non-Federal. Cost apportionments for the LPP would be dependent upon ASA(CW) approval of the requests for exception. Minimum and maximum Federal costs for the LPP would be $9,474,100 (47.7%) and $12,484,700 (62.9%), respectively, depending upon the approval decision. Minimum and maximum non-Federal costs would be $7,374,900 (37.1%) and $10,385,500 (52.3%), respectively.

f. The Recommended Plan will cause no significant environmental impacts within the study area. A draft Finding of No Significant Impact (FONSI) has been prepared and is included herein. Distribution of this report, including the FONSI, will be made to the public for review and comment.

g. Further evaluation, including Value Engineering (VE) studies, will be conducted on the recreation features in the preconstruction, engineering and design phase. The results of these studies may alter the project materials, design, costs, and cost apportionment or amount of Federal participation in the project.

RECOMMENDATIONS

I recommend that the flood damage reduction, ecosystem restoration and recreation measures identified as the Recommended Plan for the Johnson Creek, Arlington, study area be authorized for construction.

I also recommend consideration of the requests for exceptions, allowing full Federal participation in the Locally Preferred Plan.

The above recommendations are made with the provision that prior to project implementation, the non-Federal sponsor shall enter into a binding agreement with the Secretary of the Army to perform the following items of local cooperation:

a. Provide all lands, easements, rights-of-way, relocations and suitable disposal areas;

b. Pay during the period of construction all costs for locally preferred features of the Recommended Plan;

c. Hold and save the United States free from damages due to the construction, operation, or maintenance of the project except those damages due to the fault or negligence of the United States or its contractors;

d. Operate, maintain, repair, replace, and rehabilitate the completed project in accordance with regulations prescribed by the Secretary of the Army;

e. Ensure that lands utilized for ecosystem restoration are not used for purposes incompatible with such restoration, and prevent future encroachments or modifications which might interfere with proper functioning of the project;

f. Participate in the National Flood Insurance Program and other applicable Federal floodplain management programs;

g. Provide guidance and leadership to prevent unwise future development in the floodplain;

h. Assume financial responsibility for all costs incurred in cleanup of hazardous materials located on project lands covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), for which no cost sharing credit will be given, and operate, maintain, repair, replace, and rehabilitate the project in a manner so that liability will not arise under CERCLA.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent to the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and implementation funding. However, prior to transmittal to the Congress, the sponsor, the State, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

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James S. Weller
Colonel, Corps of Engineers
District Engineer

LIST OF PREPARERS

The people who were primarily responsible for contributing to the preparation of this Interim Feasibility Report and Integrated Environmental Assessment are listed in table 6-1.

Table 6-1
List of Preparers

NAME	DISCIPLINE/ EXPERTISE	EXPERIENCE	ROLE IN DOCUMENT
Gene T. Rice, Jr.	Civil Engineer	15 years, Corps of Engineers	Project Management
Billy K. Colbert	Environmental Resource Planner	8 years Corps of Engineers; 15 years U.S. Fish and Wildlife Service	Report - EA Preparation
Hank Jarboe	Environmental Biology	18 years natural resource management	EA - Data Review, Evaluation and Document Preparation
Marcia Hackett	Biology	5 years wetland and landscape ecology	EA Preparation
Linda Lopez	Environmental Specialist	Started with Corps in May 1997	EA Preparation
Jim Drysdale	Environmental Design	10 years, Corps of Engineers	HTRW Analysis
A. Frank Servello	Cultural Resources	2 years, Corps of Engineers; 9 years University; 16 years private sector	Report - EA Preparation; SHPO Concurrence
Jeffrey Comer	Civil Engineer	17 years, Corps of Engineers	Civil Design
Efren Martinez	Civil Engineer	14 years, Corps of Engineers	Civil Design
Craig Loftin	Hydraulic Engineer	17 years, Corps of Engineers	Hydrologic and Hydraulic Analysis
Lanora Wright	Economist	12 years, Corps of Engineers	Economics
Randy Roberts	Realty Specialist	14 years, Corps of Engineers	Real Estate
Gloria Collier	Geotechnical Engineer	6 years, Corps of Engineers	Geotechnical Design

NAME	DISCIPLINE EXPERTISE	EXPERIENCE	ROLE IN DOCUMENT
Kevin Craig	Civil Engineer	5 years, private sector; 2 years, TxDOT; 3 years, Corps of Engineers	Technical Management; Report Preparation
Bill Cotten	Landscape Architect	10 years, Corps of Engineers	Recreation Planner
Jim Sears	Cost Estimating	42 years, Corps of Engineers	Cost Estimating
Doug Shaw	Cost Estimating	24 years, Corps of Engineers	Preparation - MCACES Cost Estimate

DRAFT FINDING OF NO SIGNIFICANT IMPACT

UPPER TRINITY RIVER BASIN, TEXAS
JOHNSON CREEK, ARLINGTON

At the request of the city of Arlington, and under authority of an April 22, 1988 resolution by the United States Senate Committee on Environmental and Public Works, the Fort Worth District Corps of Engineers conducted a study (Interim Feasibility-Level Investigation and Environmental Assessment) to identify water and water related land resource needs of the Johnson Creek floodplain within the city limits of Arlington, Texas.

Alternatives considered during this investigation included several structural and non-structural alternatives, including a no action plan. Utilizing the results of detailed investigations conducted under authority of Section 205 of the Flood Control Act of 1948 and presented in the Detailed Project Report, Johnson Creek, Arlington and Grand Prairie, dated May 1990, the structural alternatives investigated included the optimal channelization plan recommended in that study and variations of that plan based on changes in channel bottom widths. Bottom widths analyzed were 20-, 30- and 40-feet. A full range of non-structural alternatives were investigated and detailed in the 1990 report including floodplain management, flood warning, flood proofing, structure relocation and permanent evacuation, but the evacuation and buyout of the 2-, 5-, 10- and 25-year flood zones for each individual reach within the study area, and for the entire watershed aggregately were evaluated in much greater detail in this current study.

The National Economic Development (NED) plan identified in this investigation consists of the evacuation and buyout of a total of 109 structures in the 5-year flood zone within reaches 5 and 6 of the Johnson Creek watershed. Recreational features consist of approximately 8,000 linear feet of concrete pedestrian and bike trails, access points, three footbridges, picnic sites and pavilion and parking lots. Environmental restoration features include acquisition of approximately 195 acres of currently undeveloped areas within the riparian corridor along the watershed, replanting of native trees and shrubs on roughly 94 acres of existing grass and shrub lands and forest management and habitat improvement to the remaining 101 acres of existing forested lands.

The city of Arlington, as the local sponsor for this study, selected a Locally Preferred Plan (LPP) that differs from the NED. The LPP includes the evacuation and buyout of 138 structures in the 25-year flood zone in reach 5, plus the two structures in reach 6 included in the NED plan. Recreation features for this plan consist of approximately 31,000 linear feet of concrete pedestrian and bike trails, access points, 11 footbridges, picnic sites and pavilion and parking lots. Due to the sponsor's desire to eventually add detention ponds in two of the areas proposed for environmental restoration in the NED plan, these two areas would be removed from project consideration for the LPP. Therefore, environmental features would include acquisition of approximately 155 acres of undeveloped lands along the watershed's riparian corridor, replanting of native trees and shrubs on roughly 61 acres of existing grass and shrub lands and forest management and habitat improvement to the remaining 93 acres of existing forested lands.

The proposed project has been reviewed in accordance with Section 404 of the Clean Water Act. Since the recommended plan is a non-structural buyout, the only constructed project features proposed include a number of recreational trail bridge crossings of Johnson Creek. As proposed, these crossings would span waters of the United States and wetlands, therefore the bridge crossings would be in non-jurisdictional areas and would be in compliance with Section 404. A small area of stream bank protection may be required.

The quantity of material and overall size of the protection would comply with the terms and conditions of Nationwide permit 13, Streambank Protection. The State of Texas has reviewed and provided water quality certification for Nationwide permit 13 and no further evaluation of Section 404 of the Clean Water Act is necessary.

In addition to Section 404, Executive Order 11988, Floodplain Management, was considered during the development of the proposed project. There are no practical alternatives to achieve the project purposes of environmental restoration and recreation trail development without placing fill within the floodplain. Material removed from the project area requiring disposal, as part of the non-structural plan, would be placed in approved landfills for the types of materials involved. The proposed fill actions would not result in adverse environmental impacts and further, floodplain fill for recreational trail and environmental restoration would not directly or indirectly induce additional development in the floodplain and would, therefore, be in compliance with Executive Order 11988. Executive Order 11990, Protection of Wetlands was also considered during the development of the proposed project. The proposed project would neither adversely impact nor result in any loss of wetland areas so the project is in compliance with Executive Order 11990.

Cultural resources compliance issues have consistently been addressed throughout the Johnson Creek study in consultation with the Texas State Historic Preservation Office. Archeological investigations did not locate any historic properties in the project area. Based on the information provided, the potential for impacting any historic properties in the future is low. Monitoring of construction activities will take place and any possible impacts to potentially historic properties will be addressed in accordance with procedures and regulations under the National Historic Preservation Act in consultation with the State Historic Preservation Office.

Review by the U.S. Fish and Wildlife Service determined that the proposed project is not likely to adversely affect threatened or endangered species.

An Environmental Assessment has been made of the recommended plan and its alternatives. Based upon the Environmental Assessment and results of coordination, I have concluded that the recommended plan will not have a significant adverse effect on the human environment nor is it environmentally controversial. In addition, construction of the project will not constitute a major Federal action of sufficient magnitude to warrant preparation of an Environmental Impact Statement.

DATE_____

James S. Weller
Colonel, Corps of Engineers
District Engineer